

Serial No.: 10/519,469

Examiner: Scott M. Richey

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IN THE CLAIMS

1-12. Cancelled

13. (Previously Presented) A heterodyne laser interferometer, comprising:

a heterogeneous mode helium-neon laser light source for generating a light beam having two frequency components that are linearly polarized and perpendicular to one another;

an optical interferometer coupled to receive a first portion of the light beam from the laser light source and to generate a measured signal therefrom, said first portion including portions of the two frequency components;

a frequency converter coupled to receive the measured signal and a reference signal that is based on the remaining portion of the light beam, said remaining portion including portions of the two frequency components, said frequency converter configured to adjust the frequencies of the measured signal and the reference signal without adjusting their relative phase; and

a superheterodyne phase measurer coupled to the frequency converter for measuring a phase of the frequency converted measured signal and the frequency converted reference signal;

a signal splitter for splitting the measured electrical signal into first and second split signals;

a first mixer for multiplying the first split signal by a local oscillation signal having a frequency $f_b + f$ to produce a third signal;

a second mixer for multiplying the second split signal by a local oscillation signal having a frequency $f_b - f$ to produce a fourth signal;

a first filter for eliminating radio frequency components from the third signal to generate a fifth signal having a frequency $f + \Delta f$;

a second filter for eliminating radio frequency components from the fourth signal to generate a sixth signal having a frequency $f - \Delta f$; and

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wherein the phase measurer is configured to use the fifth signal when a Doppler frequency is positive and the sixth signal when the Doppler frequency is negative.

14. (Cancelled)